Fw: West Lake Landfill: analytical methods for isotopic Ra, Th, U in groundwater

Barry Evans to: Dan Gravatt 06/07/2012 10:50 AM

Dan,

How do you want to proceed since it sounds like the methods are different?

Barry

----- Forwarded by Barry Evans/R7/USEPA/US on 06/07/2012 10:47 AM -----

From:	Cindy White/MTG/USEPA/US
To:	Barry Evans/R7/USEPA/US@EPA
Cc:	Dan Gravatt/R7/USEPA/US@EPA
Date:	06/07/2012 10:45 AM
Subject:	Re: Fw: West Lake Landfill: analytical methods for isotopic Ra, Th, U in groundwater

Barry,

Our methods are as follows:

Uranium/Thorium: **NAREL-U-Eichrom** and **NAREL-Th-Eichrom** --- extraction chromatography methods with counting by alpha spectroscopy. I'm not sure how these compare to NAS NS3004 and NAS NS3050. I'm not familiar with those method names, but if I google them, it looks like they are fluorometric methods. Confirm with the other lab.

Radium-226: **NAREL-Ra226-Eichrom** --- extraction chromatography with counting by alpha spectroscopy. This is different from the EPA 903.1 which is radon emanation method.

Radium-228: **NAREL-Ra-05** --- which is similar to the EPA 904.0 method.

If you think our methods are comparable and you want us to do the work, please complete the attached *Project Request Form* and return to me for approvals.

NAREL ANALYTICAL REQUEST FORM 11-18-11.doc

Thanks,

Cindy White
Analytical Services Coordinator
USEPA/NAREL
540 S. Morris Avenue
Montgomery, AL 36115
334-270-7052 Work
334-270-3454 FAX

Barry Evans Good Morning Cindy, Below is an email from the... 06/07/2012 09:26:53 AM

From: Barry Evans/R7/USEPA/US

0714 40458419 3.0

Superfund

0401

To: Cindy White/MTG/USEPA/US@EPA
Cc: Dan Gravatt/R7/USEPA/US@EPA
Date: 06/07/2012 09:26 AM
Subject: Fw: West Lake Landfill: analytical methods for isotopic Ra, Th, U in groundwater

Good Morning Cindy,

Below is an email from the Project Leader for the radchem project we have been discussing. They would like to use methods comparable to the PRP lab since EPA is taking splits and having them analyzed (by NAREL). Do the radchem method references below mean anything to you/ If you are familiar with them, are they comparable to the methods that your lab will utilize? Please advise.

Regards,
Barry

----- Forwarded by Barry Evans/R7/USEPA/US on 06/07/2012 09:22 AM -----

From: Dan Gravatt/R7/USEPA/US
To: Barry Evans/R7/USEPA/US@EPA
Date: 06/06/2012 10:15 AM
Subject: Fw: West Lake Landfill: analytical methods for isotopic Ra, Th, U in groundwater

Barry, this is what I got back from the PRP's contractor on the analytical methods they intend to use at my Westlake site where I'll be splitting samples. Are these method designations for Ra, Th, U something NAREL would be familiar with? I've never heard of the NAS methods...

Thanks,
Daniel R. Gravatt, PG
US EPA Region 7 SUPR / MOKS
901 North 5th Street, Kansas City, KS 66101
Phone (913) 551-7324 Fax (913) 551-7063

Principles and integrity are expensive, but they are among the very few things worth having.
----- Forwarded by Dan Gravatt/R7/USEPA/US on 06/06/2012 10:13 AM -----

From: "Paul Rosasco" <paulrosasco@emsidenver.com>
To: Dan Gravatt/R7/USEPA/US@EPA
Date: 06/06/2012 10:11 AM
Subject: RE: West Lake Landfill: analytical methods for isotopic Ra, Th, U in groundwater

The analytical methods that we currently anticipate using are listed below. I may not have the most current alphanumeric designation ("B" or "C") for the semivolatile method.

Analytes	Analytical Method
Thorium isotopes	NAS NS-3004
Uranium isotopes	NAS NS-3050
Radium-226	EPA 903.1

Radium-228	EPA 904.0

From: Dan Gravatt [mailto:Gravatt.Dan@epamail.epa.gov]
Sent: Monday, June 04, 2012 3:12 PM
To: Paul Rosasco
Subject: West Lake Landfill: analytical methods for isotopic Ra, Th, U in groundwater

Paul,
I am trying to put together analytical services to do splits of some groundwater samples for the upcoming groundwater sampling event. My lab folks think they have identified an internal EPA lab that can do the work, but I want to make sure they are using similar or identical methodology to your lab so the results are truly comparable. Could you give me the analytical method numbers and the analytical method descriptions themselves, if possible, so I can compare to our lab's methods?

Thanks,
Daniel R. Gravatt, PG
US EPA Region 7 SUPR / MOKS
901 North 5th Street, Kansas City, KS 66101
Phone (913) 551-7324 Fax (913) 551-7063

Principles and integrity are expensive, but they are among the very few things worth having.

NAREL ANALYTICAL REQUEST FORM

This form must be completed at least 14 days before sending any samples to NAREL for analysis. The requester is to complete all fields highlighted in BLUE and e-mail the form to Cindy White (white.cindy@epa.gov) along with an electronic copy of the project's QA plan and detailed site and project description.

Requester:		Request Date:	
Title:		Office/Region:	
Address			
Phone:		FAX:	
E-mail:			

PROJECT INFORMATION

Please provide or attach a detailed site and project description including known or suspected hazards.

Site Name and location:

Site Program Type: ☐ Regional ☐ Superfund ☐ Other _____

Expected Arrival Date at NAREL:

Number of Samples and Matrices:	Soil	Sediment	Water	Air Filter	Tissue	Other

PROJECT SPECIFIC REQUIREMENTS

For requirements other than NAREL standards, an Analytical Protocol Specification (APS) form must be completed. (Please see attachments for NAREL standards and the APS form.)

Specialized Handling: ☐ Radiochemicals ☐ Hazardous Chemicals ☐ Biohazards ☐ Other_____

Sample Preparation: ☐ NAREL Standard ☐ Other _____

Quality Control: ☐ NAREL Standard ☐ Other _____

Turnaround Time: ☐ NAREL Standard ☐ Other _____

Data Reporting: ☐ NAREL Standard ☐ Other _____

MDCs & RLs: ☐ NAREL Standard ☐ Other _____

NAREL ANALYTICAL SERVICES

Analysis	Check to Request	Analysis	Check to Request
Gamma Spectrometry (21 day ingrowth)	☐	Americium	☐
Gamma Spectrometry	☐	Technectium-99	☐
Gross Alpha/Beta	☐	Radium-226 (water only)	☐
Tritium (water only)	☐	Radium-228	☐
Iodine-131 (water only)	☐	Plutonium	☐
Strontium	☐	Neptunium (soil only)	☐
Uranium	☐	Metals	☐
Thorium	☐	Mercury	☐

ATTACHMENT 1

NAREL STANDARD SAMPLE PREPARATION

Liquid samples are checked for pH and adjusted if necessary. Otherwise liquid samples are analyzed as received.

Solid samples are dried and ashed for all analyses except gamma which uses the dried portion. If only gamma and gross alpha and beta analyses are requested, then samples are only dried for analysis. Foreign materials such as rocks, sticks, leaves, etc. are removed before ashing.

Filter preparation is based on filter type, size, and requested analysis. Filters may be analyzed as received or may be dissolved prior to analysis.

NAREL STANDARD QUALITY CONTROL INFORMATION

Standard QC analyses at NAREL are performed on batches of up to 20 samples of similar matrices. The QC analyses include:

Method	Method blank	LCS	Replicates	Matrix spike
Gross α/β for air filters			X	
Gross α/β for water	X	X	X	X
Gross α/β for other matrices	X	X	X	
Gamma-ray spectrometry	X	X	X	
Tritium in water	X	X	X	X
Tritium in other matrices	X	X	X	If there is a chemical separation
Actinides	X	X	X	
Radium-228	X	X	X	X
Strontium	X	X	X	
Iodine-131	X	X	X	
Technetium-99	X	X	X	X
Metals	X	X	X	X
Mercury	X	X	X	X

Note: For analyses requiring duplicate (replicate) and matrix spike analyses, a sufficient amount of sample must be received. The sample-duplicate combination and the sample-matrix spike combination can be performed on two different samples, e.g., one will be split and duplicated, the second will be split and spiked, or on one sample if at least three volumes of sample are received.

NAREL STANDARD TURNAROUND TIMES

Turnaround times are based on the date of receipt of the last sample for the project and are given in weeks.

Method	Solid	Water	Air Filter
Gamma-ray spectrometry	2	2	3
Gross α/β	3	2	3
Tritium	*	4	*
Iodine-131	*	3	*
Strontium	6	5	6
Actinides	6	6	6
Radium-228	6	6	6
Metals	4	4	*
Mercury	4	4	*

* Analysis not available

ATTACHMENT 1

NAREL STANDARD DATA REPORTING

The NAREL standard data deliverable includes sample and QC results. Results will be reported as pCi/gdry for solids, pCi/L for liquids, and pCi/m^3 for air filters. Results for hazardous waste analyses will be reported as µg/L for liquids and mass/kg for soils. A hard copy of the report will be sent to the requester. (Electronic data deliverables are available upon request.)

NAREL STANDARD SAMPLE DISPOSAL

Samples will be returned to the requester if NAREL cannot arrange for disposal at a minimal cost.

NAREL STANDARD MDCs & RLs

Standard MDCs and reporting limits are listed in the tables below. MDCs and Reporting Limits depend on a number of variables including sample size, counting times, instrument backgrounds, matrix interferences, dilutions, etc. The actual MDC and Reporting Limit for each sample will be different from those listed below based on each of these variables.

RADIOCHEMICAL MDCs

Analysis Type	Drinking Water Aliquot Size	Drinking Water MDC	Water (other) Aliquot Size	Water (other) MDC	Solids Aliquot Size	Solids MDC	Air Aliquot Size	Air MDC
Gross Alpha	500 mL	1.8 pCi/L	200 mL	4.4 pCi/L	0.1 g	8.7 pCi/g		
Gross Beta	500 mL	1.4 pCi/L	200 mL	3.5 pCi/L	0.1 g	7 pCi/g	2500 m^3	0.0015 pCi/m^3
Radium-226			1 L	0.02 pCi/L	0.5 g	0.04 pCi/g		
Radium-228			1 L	1 pCi/L	0.5 g	2 pCi/g		
Iodine-131			2 L	0.7 pCi/L				
Strontium-89			2 L	1 pCi/L	0.5 g	4 pCi/g		
Strontium-90			2 L	1 pCi/L	0.5 g	4 pCi/g		
Uranium- 234, 235, 238 Thorium-230, 232 Plutonium-238, 239 Americium-241			1 L	0.1 pCi/L	0.5 g	0.2 pCi/g	60000 m^3	2 pCi/m^3
Thorium-227			1 L	0.2 pCi/L	0.5 g	0.35 pCi/g		
Thorium-228			1 L	0.15 pCi/L	0.5 g	0.3 pCi/g		
Tritium			10 mL	0.1 nCi/L				

Inorganic Metals Reporting Limits

Analyte	Water Reporting Limit	Soil / Sediment Reporting Limit	Analyte	Water Reporting Limit	Soil / Sediment Reporting Limit
Aluminum	200 :g/L	20 mg/kg	Magnesium	5000 :g/L	500 mg/kg
Antimony	60 :g/L	6 mg/kg	Manganese	15 :g/L	1.5 mg/kg
Arsenic	10 :g/L	1 mg/kg	Mercury	0.2 :g/L	0.1 mg/kg
Barium	200 :g/L	20 mg/kg	Nickel	40 :g/L	4 mg/kg
Beryllium	5 :g/L	0.5 mg/kg	Potassium	5000 :g/L	500 mg/kg
Cadmium	5 :g/L	0.5 mg/kg	Selenium	5 :g/L	0.5 mg/kg
Calcium	5000 :g/L	500 mg/kg	Silver	10 :g/L	1 mg/kg
Chromium	10 :g/L	1 mg/kg	Sodium	5000 :g/L	500 mg/kg
Cobalt	50 :g/L	5 mg/kg	Thallium	10 :g/L	1 mg/kg
Copper	25 :g/L	2.5 mg/kg	Vanadium	50 :g/L	5 mg/kg
Iron	100 :g/L	10 mg/kg	Zinc	20 :g/L	2 mg/kg
Lead	3 :g/L	0.3 mg/kg			

ATTACHMENT 2

Analytical Protocol Specification (APS)

Please complete the APS for any project specific requirements where the NAREL standards listed above do not meet those required by the project's QA plan. More than one APS may be necessary to cover all requirements. NAREL will respond if requirements cannot be met by offering alternatives to the requirements which will be described on an Analytical Protocol Specification Alternate Proposal (APSAP) form and attached to the Project Acceptance Form (PAF.). The PAF and any APSAP forms will be sent to the requester for signatures indicating acceptance of the data delivery dates and any proposed alternatives.

Site/Project Name: _____

Analyte List: _____ Analysis Restrictions: _____

_____

Matrix: _____ Possible interferences: _____

_____

Concentration range: _____ Action level: _____

MQOs

Analytical QC

Batch size: □ 20 samples □ Other _____		
QC Sample Type	**Frequency**	**Evaluation Criteria**
□ Method blank		
□ Duplicate		
□ Laboratory control sample		
□ Matrix spike		
□ Matrix spike duplicate		

Analytical Process Requirements

Activity	Special Requirements
Sample receipt and inspection	
Laboratory sample preparation	
Sample dissolution	
Chemical separations	
Preparing sources for counting	
Nuclear counting	
Data reduction and reporting	
Sample disposal	
Other	

Turnaround Time Requirements

Analysis	Special Requirements

Other requirement not listed above: _____

Requester's signature: _____ Date: _____

ATTACHMENT 3

NAREL SAMPLE SHIPMENT GUIDELINES

This document provides guidance in the shipment of environmental samples to NAREL for radiochemical and/or hazardous chemical analyses.

All shipments must comply with the requirements of current DOT regulations. Refer to the DOT Hazardous Materials Regulations contained in Title 49 CFR Subtitle B, Chapter 1, Subchapter C, Parts 171 through 180.

Before collecting samples please refer to the attached table for requested sample sizes, containers and preservatives. For matrices not listed contact the NAREL Analytical Services Coordinator at (334)270-7052.

Before shipping samples, notify the NAREL Analytical Services Coordinator at (334)270-7052 and arrange for sample receipt and subsequent sample return 6 months after results have been reported.

When packing samples for shipment:

-Seal individual samples in plastic bags, preferably ziplock bags.

-Use the correct amount of absorbent material for the volume present. Approved absorbent materials include vermiculite and cat litter.

-The temperature of samples requiring refrigeration during transport MUST be maintained at or below 6°C.

-Ice in a sealed plastic bag or reusable ice substitute freeze packs are acceptable cooling media.

-Chain of Custody forms MUST be sealed in a large ziplock bag and taped to the inside of the cooler lid.

After samples are packed for shipment, secure the cooler with tape and attach a custody seal across the seam of the cooler lid.

All samples MUST be shipped overnight to arrive Monday through Friday. No deliveries are accepted on weekends or Federal holidays.

Send all samples to:

Cindy White
Analytical Services Coordinator
National Air and Radiation Environmental Laboratory
540 South Morris Avenue
Montgomery, Alabama 36115
(334) 270-7052

ATTACHMENT 4
SAMPLE COLLECTION AND ANALYSIS INFORMATION

	Water Samples				Soil / Sediment Samples			
Analysis	Collection Volume	Acceptable Containers	Preservative	Holding Times	Collection Volume (g)	Acceptable Containers	Preservative	Holding Times
Metals (except mercury)	600 mL	Polyethylene	HNO_3 to pH <2	6 months	200 g	Polyethylene	Cool to ≤ 6 ° C	6 months
Mercury	400 mL	Polyethylene	HNO_3 to pH <2	28 days	200 g	Polyethylene	Cool to ≤ 6 ° C	28 days
Volatile Organics	2 X 40 mL no headspace	40 mL glass vials w/ Teflon lined caps	pH <2 with H_2SO_4, HCl, or solid $NaHSO_4$ Cool to ≤ 6 ° C	14 days	2 X 5 g	40 mL glass vials with Teflon lined cap	Solid $NaHSO_4$ Cool to ≤ 6 ° C	14 days
Pesticides & PCBs Semivolatile Organics	2 L	2 X 1 L amber glass container with Teflon lined cap	Cool to ≤ 6 ° C	Samples extracted within 7 days of collection and extracts analyzed within 40 days following extraction	1 full 8 oz glass jar	8 oz glass jar with Teflon lined cap	Cool to ≤ 6 ° C	Samples extracted within 14 days of collection and extracts analyzed within 40 days following extraction
Tritium	200 mL	Glass withTeflon lined caps	None, **NO ACID**	NA				
Other Radiochemical Analyses	4 L*	Plastic or glass	HNO_3 to pH <2	NA	~ 500 g	Plastic or glass	None	NA

*Sufficient volume must be provided to allow a dedicated aliquant for gamma analysis.